DPP

DAILY PRACTICE PROBLEMS

CLASS : XIth
DATE :

Solutions

SUBJECT : CHEMISTRY
DPP No. : 5

Topic :- SOLUTIONS

1 **(c)**

Vapour pressure of a liquid in a closed container increases with increase in temperature

2 **(c)**

From Raoult's law : $\frac{P_0 - P_s}{P_0} = \frac{N_1}{N_1 + N_2}$

$$1 - \frac{P_s}{P_0} = \frac{N_1}{N_1 + N_2}$$

or $\frac{P_s}{P_0} = \frac{N_2}{N_1 + N_2}$

i.e., $P_s = P_0 = \frac{N_2}{(N_1 + N_2)}$

$P_s = P_0 \times$ mole fraction of solvent.

3 **(c)**

Solutions having same osmotic pressure are called isotonic solutions.

π gloucose = π unknown solute

$$\frac{5}{180} = \frac{2}{M} \quad or \quad M = \frac{180 \times 2}{5} = 72$$

4. **(b)**

Follow definition of diffusion.

5 **(b)**

Boiling point $(T_b) = 100 + \Delta T_b = 100 + k_b m$

Freezing point $(T_f) = 0 - \Delta T_f = -k_f m \quad T_b - T_f = (100 + k_b m) - (-k_f m)$

$105 = 100 + 0.51\text{m} + 1.86\text{m}$

$2.37\, m = 5$ or $m = \frac{5}{2.37} = 2.11$

$\therefore$ Weight of sucrose to be dissolved in 100 g water

$= \frac{2.11 \times 342}{1000} \times 100 = 72\text{g}$

6 **(c)**

$$\frac{\Delta T_b}{\Delta T_f} = \frac{K_b}{K_f}$$

$$\therefore \quad \Delta T_f = \frac{K_f}{K_b} \times \Delta T_b = \frac{1.86}{0.512} \times 0.18$$

$$= 0.654$$

$\therefore$ f.pt. $= 0 - 0.654 = -0.654$ C

7 **(c)**

$$\text{Molarity of base} = \frac{\text{Normality}}{\text{Acidity}} = \frac{0.1}{1} = 0.1$$

$M_1V_1 = M_2V_2$

$0.1 \times 19.85 = M_2 \times 20$

$M_2 = 0.09925 \approx 0.099$

8 **(c)**

Vapour pressure of a solvent is lowered by the presence of solute in it. Lowering in vapour pressure is a Colligative property. *i.e.*, it depends on the number of particles present in the solution. $Cu(NO_3)_2$ give the maximum number of ions (*i.e.*, 3)so, it causes the greatest lowering in vapour pressure of water.

9 **(b)**

In the molarity and normality the volume of the solution is considered while in molality the mass of the solvent is considered. Molarity and normality change with temperature because of expansion of contraction of the liquid with temperature. However, molality does not change with temperature because mass of the solvent does not change with temperature.

10 **(c)**

$$\text{Molality} = \frac{n \times 1000}{\text{mass of solvent (g)}}$$

$$= \frac{18 \times 1000}{180 \times 500} = 0.2 \text{ m}$$

11 **(a)**

$BaCl_2$gives maximum ion hence, it shows lowest vapour pressure

12 **(d)**

Solution is isotonic.

$\Rightarrow \qquad C_1RT = C_2RT$

$\qquad C_1 = C_2$

Density of both the solutions are assumed to be equal to

1.0 g cm^{-3}.

5.25% solution of a substance means 100g solution contains

5.25 g solute and 1000g solution contain 52.5g solute.

Hence, $\frac{52.5}{M} = \frac{15}{60}$,

M= molecular mass of the substance

M= $\frac{52.5 \times 60}{15}$=210

13 **(a)**

Elevation in boiling point is a colligative property, *i.e.*, depends only on number of particles of ions. 0.1 M $FeCl_3$ gives maximum number of ions, thus has highest boiling point.

14 **(a)**

$Al_2(SO_4)_3$ produces maximum number of ions so, it will have highest osmotic pressure.

15 **(a)**

Normality of acid=molarity $\times$ basicity

$0.2 = M \times 2$

$\therefore M = \frac{0.2}{2} = 0.1$

16 **(a)**

In solution the KCl and $CuSO_4$ produces same number of ions in solution.

$KCl \rightleftharpoons K^+ + Cl^-$

$CuSO_4 \rightleftharpoons Cu^{2+} + SO_4{}^{2-}$

Both produced two ions in solution.

So, ionic strength of a solution is combined ionic strength of both of the salt.

=0.1+.02=0.3 mol/kg

17 **(a)**

Let molarity o $Ba(OH)_2 = M_1$

$\therefore$ Normality $= 2M_1$

Molarity of HCl $= 0.1$ M $= 0.1$ N

$N_1V_1 = N_2V_2$

$2\,M_1 \times 25 = 0.1 \times 35$

$M_1 = 0.07$ M

18 **(c)**

Glucose ($C_6H_{12}O_6$) is a non-electrolyte, hence i=1, while others are electrolyte, hence $i >$ 1.

$\therefore \Delta T_f = i \times k_f \times molality$

The value of ΔT_f is lowest for glucose, hence its freezing point is maximum.

19 **(b)**

$N = \frac{w \times 1000}{\text{eq. wt.} \times V(\text{mL})} = \frac{4 \times 1000}{40 \times 100} = 1.0$ N

ANSWER-KEY										
Q.	1	2	3	4	5	6	7	8	9	10
A.	C	C	C	B	B	C	C	C	B	C
Q.	11	12	13	14	15	16	17	18	19	20
A.	A	D	A	A	A	A	A	C	B	C